CLAIMS

1. Optical system (10; 20) for a charged particle multi-beam system, comprising

an electrostatic lens component for a plurality of charged particle beams (12) comprising at least two electrostatic sub-lenses and

a magnetic lens component for a plurality of charged particle beams comprising at least two magnetic sub-lenses, whereby the sub-lenses share a common excitation coil (15);

the electrostatic and the magnetic lens component forming a multi-lens for a plurality of charged particle beams comprising at least two sub-lenses;

each sub-lens comprising an opening (14) for a charged particle beam; and

each sub-lens is adapted to focus a charged particle beam.

2. Optical system according to any of the preceding claims, whereby each of the at least two electrostatic sub-lenses comprises at least one electrode (18), the electrodes of the at least two electrostatic sub-lenses being on a common potential.

3. Optical system according to any of the preceding claims, whereby each of the at least two electrostatic sub-lenses comprises at least a first and a second electrode (18, 19).

4. Optical system according to any of the preceding claims, whereby the first electrodes of the at least two electrostatic sub-lenses are on a common potential and the second electrodes of the at least two electrostatic sub-lenses are on a common potential.

5. Optical system according to any of the preceding claims, whereby the electrostatic lens component for a plurality of charged particle beams is an immersion lens component for a plurality of charged particle beams.

6. Optical system according to any of the preceding claims, whereby the electrostatic lens component for a plurality of charged particle beams is a retarding lens component for a plurality of charged particle beams.

7. Optical system (10; 20) according to any of the preceding claims, whereby the magnetic sub-lenses are radial-gap lenses.

8. Optical system according to any of claims 1 to 6, whereby the magnetic sub-lenses are axial-gap lenses.

9. Optical system according to any of claims 1 to 6, whereby the magnetic sub-lenses are radial-axial-gap lenses.

10. Optical system according to any of the preceding claims, whereby a lens field area of the electrostatic sub-lens is below a lens field area of the respective magnetic sub-lens.

11. Optical system according to any of claims 1 to 9, whereby a lens field area of the electrostatic sub-lens is above a lens field area of the respective magnetic sub-lens.

12. Optical system according to any of claims 1 to 9, whereby a lens field area of the electrostatic sub-lens and a respective lens field area of the magnetic sub-lens overlap.

13. Optical system according to any of the preceding claims, whereby one electrode (18, 19) of each of the at least two electrostatic sub-lenses is on a beam boost potential.

14. Optical system (10; 20) according to any of the preceding claims, comprising means (102; 112) for fine focusing.

15. Optical system according to any of the preceding claims, comprising an extraction electrode (122) component with an extraction electrode for each of the at least two charged particle beams.

16. Optical system according to any of the preceding claims, comprising a scan deflection unit (144, 146; 152).

17. Optical system according to any of the preceding claims, comprising an individual scan deflection unit for each of the at least two charged particle beams.

18. Optical system according to any of claims 16 to 17, whereby the scan deflection unit is an in-lens scan deflection unit (152).

19. Optical system according to any of the preceding claims, comprising a detection unit (162, 174).

20. Optical system according to claim 19, whereby the detection unit comprises a spectrometer.

21. Method for focusing at least two charged particle beams on a specimen, comprising the steps of:

providing an optical system with

an electrostatic lens component for a plurality of charged particle beams comprising at least two electrostatic sub-lenses, and

a magnetic lens component for a plurality of charged particle beams comprising at least two magnetic sub-lenses, and

at least two separate openings for each of the at least two charged particle beams traveling through the optical system,

controlling a current for an excitation coil of the magnetic lens component, thereby focusing the at least two electron beams;

controlling at least two potentials of the electrostatic lens component, thereby focusing the at least two electron beams;

22. Method according to claim 21, whereby each of the electrostatic sub-lenses is provided with at least a first and a second electrode.

23. Method according to any of claims 21 to 22, controlling the first electrodes or the second electrodes separately for each of the at least two electrostatic sub-lenses.

24. Method according to any of claims 21 to 23, further controlling focusing properties correction means.

25. Method according to any of claims 21 to 24, further scanning the at least two charged particle beams over an area of the specimen.

26. Multiple charged particle beam device, comprising

a charged particle beam source (102);

a detector for detecting secondary particles (162);

beam shaping means (A);

a housing (191) for the charged particle beam column, whereby the housing can be evacuated;

at least one optical system (20; 180) according to any of claims 1 to 20, and at least one control unit (7, 8, 9) for the at least one optical system.

27. Multiple charged particle beam device (190) according to claim 26, further comprising a deflection unit (172a, 172b) for directing the charged particle beam away from the optical axis (11) and redirecting the charged particle beam.

28. Multiple charged particle beam device according to any of claims 26 to 27, whereby the deflection unit comprises at least two magnetic deflectors (172a, 172b).